REMARKS

Claims 12 and 19 have been canceled. Claims 10, 11, 14, and 15 through 17 have been previously canceled. Claims 1, 13, 18, and 20 have been amended. Claims 1 through 9, 13, 18, and 20 remain in the application.

Claims 1 through 8 and 12 were rejected under 35 U.S.C. § 103 as being unpatentable over Gimby (U.S. Patent No. 4,938,254) in view of Wynn (U.S. Patent No. 4,129,145) and further in view of Smith (U.S. Patent No. 4,813,452). Applicants respectfully traverse this rejection.

U.S. Patent No. 4,938,254 to Gimby discloses an over-pressure relief valve. A fuel valve 10 has a valve member 12 which is positioned within the opening O and which is reciprocable within the opening O along the central axis of the opening O. The valve member 12 has a first end 14, which is positioned adjacent to an outside face of the vessel V, and a second end 16, which is positioned within the vessel V. The valve member 12 has a part toroidal recess 18 positioned adjacent to the first end thereof, and the valve member 12 carries an elastomeric O-ring 20 which is retained in the recess 18. Gimby does not disclose a valve member having a hub with a generally hemi-spherical shape and an annular groove extending radially into the hub. Gimby also does not disclose a valve member having at least one outlet port disposed below the groove and located axially between a valve seat and one end of a valve housing when the valve member is in the closed position to prevent fuel flow, the valve member traveling a predetermined dwell distance before the outlet port is exposed and fluid flow can exit past the valve seat when the valve member is in the open position, creating a flow area large enough to prevent a venturi that limits travel of the valve member.

U.S. Patent No. 4,129,145 to Wynn discloses a check valve assembly. A valve seat 14 has a seating surface 16 facing toward a downstream end 12 of a valve body 10. The seating surface 16 is preferably inclined with respect to a centerline of the valve body 10. A shoulder 18 is located on the upstream side of the valve seat 14 and defines a recess 20. A poppet element 22 is adapted to be inserted within the valve body 10 through an upstream end 11 thereof. The poppet element 22 has a circumferential surface 24 at its downstream end. The circumferential surface 24 has a narrow neck 26, and the portion 28 of the circumferential surface 24 downstream of the neck 26 has a frustoconical configuration. Wynn does not disclose a valve member having a hub with a generally hemi-spherical shape and an annular groove extending radially into the hub. Wynn also does not disclose a valve member having at least one outlet port disposed below the groove and located axially between a valve seat and one end of a valve housing when the valve member is in the closed position to prevent fuel flow, the valve member traveling a predetermined dwell distance before the outlet port is exposed and fluid flow can exit past the valve seat when the valve member is in the open position, creating a flow area large enough to prevent a venturi that limits travel of the valve member.

U.S. Patent No. 4,813,452 to Smith discloses a kinetic check valve. A valve 10 has a housing 12 formed by a first body portion 14 and a second body portion 16 joined together to form the housing. The first body portion 14 contains a curved shaped bore 18 extending between an intake port 22 and a shaped outlet port 20. The intake port 22 has a sealing land 24 formed at the juncture between the shaped outlet port 20 with the curved shape bore 18. The first body portion 14 and second body portion 16 cooperate to form plenum 26 located near the upper portion of the housing 12 as depicted. A first port 28 is located in the second body portion 16 to allow a pressurized fluid flow into and out of the plenum on the side of a seal 36 in fluid

communication with the shaped bore 18. A second port 28 in the second body portion 16 will allow the flow of fluid into and out of the plenum to allow movement of the valve between its open and closed positions. A valve member 30 includes a stem portion 32 which connects the shaped poppet 34 and a seal 36 to form the unitary valve member. The poppet 34 has a streamlined tip 38 located on the end of the valve member 30 so that as fluid enters the outlet port 20 fluid is gently directed around the poppet and through the shaped bore 40 formed between the poppet 34 and sidewalls 42 of the outlet port 20. The sealing land 24 on the housing is designed to cooperate with the complimentary sealing land 44 formed on the poppet 34 to stop the fluid flow. The seal 36 is attached to the end of the valve member 30 opposite the poppet 34. A coil spring 48 is coaxially aligned about the stem 32 of the valve member 30. One end of spring 48 is in contact with the seal 36 and the other end of the spring contacts a lip 51 formed on the first body portion 14. The lip 51 cooperates with a raised collar 53 on the valve stem to seal plenum 26 from the bore 18 when the valve is closed. Smith does not disclose a valve member having at least one outlet port disposed below a groove thereof and located axially between a valve seat and one end of a valve housing when the valve member is in the closed position to prevent fuel flow, the valve member traveling a predetermined dwell distance before the outlet port is exposed and fluid flow can exit past the valve seat when the valve member is in the open position, creating a flow area large enough to prevent a venturi that limits travel of the valve member.

In contradistinction, claim 1, as amended, clarifies the invention claimed as a check valve for a fuel pump including a valve housing adapted to be disposed in an outlet member of the fuel pump and a valve seat formed on an interior surface of the valve housing. The valve seat has a generally frustaconical cross-sectional shape. The check valve also includes a valve member disposed in the valve housing and having a closed position to engage the valve

seat to prevent fuel from flowing through the outlet member and an open position to allow fuel to flow through the outlet member. The valve member has a hub with a generally hemi-spherical shape and an annular groove extending radially into the hub and a seal disposed in the groove for contacting the valve seat when the valve member is in the closed position. The check valve further includes a spring disposed about the valve member and located axially between the valve seat and one end of the valve housing to urge the valve member toward the valve seat. The valve member has at least one outlet port disposed below the groove and located axially between the valve seat and the one end of the valve housing when the valve member is in the closed position to prevent fuel flow. The valve member travels a predetermined dwell distance before the outlet port is exposed and fluid flow can exit past the valve seat when the valve member is in the open position, creating a flow area large enough to prevent a venturi that limits travel of the valve member.

The United States Court of Appeals for the Federal Circuit (CAFC) has stated in determining the propriety of a rejection under 35 U.S.C. § 103, it is well settled that the obviousness of an invention cannot be established by combining the teachings of the prior art absent some teaching, suggestion or incentive supporting the combination. See In re Fine, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 227 U.S.P.Q. 657 (Fed. Cir. 1985); ACS Hospital Systems, Inc. v. Montefiore Hospital, 732 F.2d 1572, 221 U.S.P.Q. 929 (Fed. Cir. 1984). The law followed by our court of review and the Board of Patent Appeals and Interferences is that "[a] prima facie case of obviousness is established when the teachings from the prior art itself would appear to have suggested the claimed subject matter to a person of ordinary skill in the art." In re Rinehart, 531 F.2d 1048, 1051, 189 U.S.P.Q. 143, 147 (C.C.P.A. 1976). See also In re Lalu, 747 F.2d 703,

705, 223 U.S.P.Q. 1257, 1258 (Fed. Cir. 1984) ("In determining whether a case of prima facie obviousness exists, it is necessary to ascertain whether the prior art teachings would appear to be sufficient to one of ordinary skill in the art to suggest making the claimed substitution or other modification.")

None of the references cited, either alone or in combination, teaches or suggests the claimed invention of claim 1. Specifically, Gimby '254 merely discloses an over-pressure relief valve in which a valve member is reciprocable within an opening and has a first end with a part toroidal recess and an elastomeric O-ring retained in the recess. Gimby '254 lacks a valve member having a hub with a generally hemi-spherical shape and an annular groove extending radially into the hub. Gimby '254 also lacks a valve member having at least one outlet port disposed below the groove and located axially between a valve seat and one end of a valve housing when the valve member is in the closed position to prevent fuel flow, the valve member traveling a predetermined dwell distance before the outlet port is exposed and fluid flow can exit past the valve seat when the valve member is in the open position, creating a flow area large enough to prevent a venturi that limits travel of the valve member. In Gimby '245, the valve member 12 first lifts off the valve seat and there is a small amount of flow, resulting in a metering technique and the valve member 12 does not travel a predetermined dwell distance before fluid flow can exit past the valve seat to prevent a venturi that limits travel of the valve member.

Wynn '145 merely discloses a check valve assembly having a valve seat located on an interior surface of a valve body. Wynn '145 lacks a valve member having a hub with a generally hemi-spherical shape and an annular groove extending radially into the hub. Wynn '145 also lacks a valve member having at least one outlet port disposed below the groove and

located axially between a valve seat and one end of a valve housing when the valve member is in the closed position to prevent fuel flow, the valve member traveling a predetermined dwell distance before the outlet port is exposed and fluid flow can exit past the valve seat when the valve member is in the open position, creating a flow area large enough to prevent a venturi that limits travel of the valve member. In Wynn '145, the valve member 22 first lifts off the valve seat 14 and there is a small amount of flow and the valve member 22 does not travel a predetermined dwell distance before fluid flow can exit past the valve seat 14 to prevent a venturi that limits travel of the valve member.

Smith '452 merely discloses a kinetic check valve in which a check valve has a valve member that includes a stem portion which connects a shaped poppet and a seal to form a unitary valve member. Smith '452 lacks a valve member having at least one outlet port disposed below a groove thereof and located axially between a valve seat and one end of a valve housing when the valve member is in the closed position to prevent fuel flow, the valve member traveling a predetermined dwell distance before the outlet port is exposed and fluid flow can exit past the valve seat when the valve member is in the open position, creating a flow area large enough to prevent a venturi that limits travel of the valve member. In Smith '452, the valve member 30 first lifts off the valve seat 24 and there is a small amount of flow and the valve member 30 does not travel a predetermined dwell distance before fluid flow can exit past the valve seat 24 to prevent a venturi that limits travel of the valve member. As such, there is no suggestion or motivation in the art for combining Gimby '254, Wynn '145, and Smith '452 together.

Even if these references could be combined, neither teaches a check valve having a valve member with at least one outlet port disposed below a groove thereof and located axially between a valve seat and one end of a valve housing when the valve member is in the closed

position to prevent fuel flow, the valve member traveling a predetermined dwell distance before the outlet port is exposed and fluid flow can exit past the valve seat when the valve member is in the open position, creating a flow area large enough to prevent a venturi that limits travel of the valve member. Applicants are not attacking the references individually, but are clearly pointing out that each reference is deficient and, if combined (although Applicants maintain that they are not combinable), the combination is deficient. The present invention sets forth a unique and non-obvious combination of a check valve having a pintel that must travel a given dwell distance away from the valve seat before an outlet port is exposed, allowing an increase in flow area to prevent low flow restriction. The references, if combinable, fail to teach or suggest the combination of a check valve for a fuel pump including a valve seat formed on an interior surface of a valve housing with a generally frustaconical cross-sectional shape and a valve member having a hub with a generally hemi-spherical shape and an annular groove extending radially into the hub, a seal disposed in the groove for contacting the valve seat, a spring disposed about the valve member and located axially between the valve seat and one end of the valve housing to urge the valve member toward the valve seat, and the valve member having at least one outlet port disposed below the groove and located axially between a valve seat and one end of a valve housing when the valve member is in the closed position to prevent fuel flow, the valve member traveling a predetermined dwell distance before the outlet port is exposed and fluid flow can exit past the valve seat when the valve member is in the open position, creating a flow area large enough to prevent a venturi that limits travel of the valve member as claimed by Applicants. The Examiner has failed to establish a case of prima facie obviousness. Therefore, it is respectfully submitted that claim 1 and the claims dependent therefrom are allowable over the rejection under 35 U.S.C. § 103.

Claims 9, 13, 18, and 19 were rejected under 35 U.S.C. § 103 as being unpatentable over Gimby (U.S. Patent No. 4,938,254) in view of Wynn (U.S. Patent No. 4,129,145) and Smith (U.S. Patent No. 4,813,452) and further in view of Clifton (U.S. Patent No. 2,011,333). Applicants respectfully traverse this rejection.

U.S. Patent No. 2,011,333 to Clifton discloses a valve. An edge 10 at a lower end of a valve member and within which a chamber 9 is formed is provided with serrations 11. Clifton does not disclose a valve member having a hub with a generally hemi-spherical shape and an annular groove extending radially into the hub. Clifton also does not disclose a fuel pump including a valve member having at least one outlet port having a metered shape disposed below the groove and located axially between a valve seat and one end of a valve housing when the valve member is in the closed position to prevent fuel flow, the valve member traveling a predetermined dwell distance before the outlet port is exposed and fluid flow can exit past the valve seat when the valve member is in the open position, creating a flow area large enough to prevent a venturi that limits travel of the valve member.

As to claim 13, claim 13, as amended, clarifies the invention claimed as a fuel pump including an outlet member having a first passageway extending therethrough and a valve housing disposed in the first passageway of the outlet member. The valve housing has a second passageway extending axially therethrough. The fuel pump also includes a valve seat formed on an interior surface of the valve housing forming the second passageway. The valve seat has a generally frustaconical cross-sectional shape. The fuel pump includes a flow tube extending axially from one end of the valve housing adjacent the valve seat. The fuel pump further includes a valve member disposed in the second passageway of the valve housing and having a closed position to engage the valve seat to prevent fuel from flowing through the outlet member and an

open position to allow fuel to flow through the outlet member. The valve member has a hub with a generally hemi-spherical shape and an annular groove extending radially into the hub, a seal disposed in the groove for contacting the valve seat, and a flow port extending therein. The fuel pump also includes a spring disposed about the valve member and located axially between the valve seat and one end of the valve housing to urge the valve member toward the valve seat. The valve member has at least one outlet port having a metered shape disposed below the groove and located axially between the valve seat and the one end of the valve housing when the valve member is in the closed position to prevent fuel flow. The valve member travels a predetermined dwell distance before the outlet port is exposed and fluid flow can exit past the valve seat when the valve member is in the open position, creating a flow area large enough to prevent a venturi that limits travel of the valve member.

None of the references cited, either alone or in combination, teaches or suggests the claimed invention of claim 13. Specifically, Gimby '254 merely discloses an over-pressure relief valve in which a valve member is reciprocable within an opening and has a first end with a part toroidal recess and an elastomeric O-ring retained in the recess. Gimby '254 lacks a fuel pump including a flow tube extending axially from one end of a valve housing adjacent a valve seat, and a valve member having a hub with a generally hemi-spherical shape and an annular groove extending radially into the hub. Gimby '254 also lacks a fuel pump including a valve member having at least one outlet port having a metered shape disposed below the groove and located axially between a valve seat and one end of a valve housing when the valve member is in the closed position to prevent fuel flow, the valve member traveling a predetermined dwell distance before the outlet port is exposed and fluid flow can exit past the valve seat when the valve member is in the open position, creating a flow area large enough to prevent a venturi that

limits travel of the valve member. In Gimby '245, the valve member 12 first lifts off the valve seat and there is a small amount of flow, resulting in a metering technique and the valve member 12 does not travel a predetermined dwell distance before fluid flow can exit past the valve seat to prevent a venturi that limits travel of the valve member.

Wynn '145 merely discloses a check valve assembly having a valve seat located on an interior surface of a valve body. Wynn '145 lacks a fuel pump including a flow tube extending axially from one end of a valve housing adjacent a valve seat, and a valve member having a hub with a generally hemi-spherical shape and an annular groove extending radially into the hub. Wynn '145 also lacks a fuel pump including a valve member having at least one outlet port having a metered shape disposed below the groove and located axially between a valve seat and one end of a valve housing when the valve member is in the closed position to prevent fuel flow, the valve member traveling a predetermined dwell distance before the outlet port is exposed and fluid flow can exit past the valve seat when the valve member is in the open position, creating a flow area large enough to prevent a venturi that limits travel of the valve member. In Wynn '145, the valve member 22 first lifts off the valve seat 14 and there is a small amount of flow and the valve member 22 does not travel a predetermined dwell distance before fluid flow can exit past the valve seat 14 to prevent a venturi that limits travel of the valve member.

Smith '452 merely discloses a kinetic check valve in which a check valve has a valve member that includes a stem portion which connects a shaped poppet and a seal to form a unitary valve member. Smith '452 lacks a fuel pump including a valve member having at least one outlet port having a metered shape disposed below a groove thereof and located axially between a valve seat and one end of a valve housing when the valve member is in the closed position to prevent fuel flow, the valve member traveling a predetermined dwell distance before

the outlet port is exposed and fluid flow can exit past the valve seat when the valve member is in the open position, creating a flow area large enough to prevent a venturi that limits travel of the valve member. In Smith '452, the valve member 30 first lifts off the valve seat 24 and there is a small amount of flow and the valve member 30 does not travel a predetermined dwell distance before fluid flow can exit past the valve seat 24 to prevent a venturi that limits travel of the valve member.

Clifton '333 merely discloses a valve having a valve member with chamber provided with serrations. Clifton '333 lacks a fuel pump including a valve member having a hub with a generally hemi-spherical shape and an annular groove extending radially into the hub. Clifton '333 also lacks a fuel pump including a valve member having at least one outlet port having a metered shape disposed below the groove and located axially between a valve seat and one end of a valve housing when the valve member is in the closed position to prevent fuel flow, the valve member traveling a predetermined dwell distance before the outlet port is exposed and fluid flow can exit past the valve seat when the valve member is in the open position, creating a flow area large enough to prevent a venturi that limits travel of the valve member. In Clifton '333, the edge 10 at a lower end of a valve member is not disposed below a groove in the valve member nor located axially between a valve seat and one end of a valve housing when the valve member is in the closed position to prevent fuel flow. As such, there is no suggestion or motivation in the art for combining Gimby '254, Wynn '145, Smith '452, and Clifton '333 together.

The present invention sets forth a unique and non-obvious combination of a fuel pump including a check valve having a pintel that must travel a given dwell distance away from the valve seat before an outlet port is exposed, allowing an increase in flow area to prevent low

flow restriction. The references, if combinable, fail to teach or suggest the combination of a check valve for a fuel pump including a valve seat formed on an interior surface of a valve housing forming a passageway with a generally frustaconical cross-sectional shape, a flow tube extending axially from one end of the valve housing adjacent the valve seat, a valve member having a hub with a generally hemi-spherical shape and an annular groove extending radially into the hub, a seal disposed in the groove for contacting the valve seat, a spring disposed about the valve member and located axially between the valve seat and one end of the valve housing to urge the valve member toward the valve seat, and the valve member having at least one outlet port with a metered shape disposed below the groove and located axially between a valve seat and one end of a valve housing when the valve member is in the closed position to prevent fuel flow, the valve member traveling a predetermined dwell distance before the outlet port is exposed and fluid flow can exit past the valve seat when the valve member is in the open position, creating a flow area large enough to prevent a venturi that limits travel of the valve member as claimed by Applicants.

Further, the CAFC has held that "[t]he mere fact that prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification". In re Gordon, 733 F.2d 900, 902, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984). The Examiner has failed to show how the prior art suggested the desirability of modification to achieve Applicants' invention. Thus, the Examiner has failed to establish a case of prima facie obviousness. Therefore, it is respectfully submitted that claim 13 and the claims dependent therefrom are allowable over the rejection under 35 U.S.C. § 103.

Claim 20 was rejected under 35 U.S.C. § 103 as being unpatentable over Gimby (U.S. Patent No. 4,938,254) in view of Wynn (U.S. Patent No. 4,129,145) and Smith (U.S. Patent

No. 4,813,452) and further in view of Hoover (U.S. Patent No. 4,964,391). Applicants respectfully traverse this rejection.

U.S. Patent No. 4,964,391 to Hoover discloses a check valve for engine fuel delivery systems. A fuel delivery system 20 includes a fuel pump 22 for delivering fuel under pressure from a supply or tank 24 to a fuel consumer 26, such as an internal combustion engine. A check valve 28 is connected in a fuel line between the fuel pump 22 and the engine for permitting free flow of fuel from the pump to the engine, but preventing back-flow of fuel from the engine to the pump when the pump is shut off. Hoover does not disclose a fuel pump including a pump section at one axial end, a motor section adjacent the pump section, an outlet section adjacent the motor section at the other axial end, the outlet section including an outlet member having a first passageway therethrough, and a valve housing disposed in the first passageway of the outlet member. Hoover also does not disclose a fuel pump including a valve member having a flow port extending therein with at least one outlet port disposed below a groove thereof and located axially between a valve seat and one end of a valve housing when the valve member is in the closed position to prevent fuel flow, the valve member traveling a predetermined dwell distance before the outlet port is exposed and fluid flow can exit past the valve seat when the valve member is in the open position, creating a flow area large enough to prevent a venturi that limits travel of the valve member.

As to claim 20, claim 20, as amended, clarifies the invention claimed as a fuel pump including a pump section at one axial end, a motor section adjacent the pump section, and an outlet section adjacent the motor section at the other axial end. The outlet section includes an outlet member having a first passageway therethrough and a valve housing disposed in the first passageway of the outlet member. The valve housing has a body portion with a second

passageway extending axially therethrough. The fuel pump also includes a flow tube extending axially from one end of the body portion and a valve seat disposed adjacent the second passageway and formed on the valve housing adjacent the flow tube. The valve seat has a generally frustaconical cross-sectional shape. The fuel pump includes a valve member disposed in the second passageway of the valve housing and having a closed position to engage the valve seat to prevent fuel from flowing through the outlet member and an open position to allow fuel to flow through the outlet member. The valve member has a hub with a generally hemi-spherical shape and an annular groove extending radially into the hub, a seal disposed in the groove for contacting the valve seat when the valve member is in the closed position. The valve housing has an enlarged opening at one end of the second passageway and the valve member has a flange at one end and disposed in the enlarged diameter portion. The fuel pump includes a spring disposed about the valve member and located axially between the flange and surface of the enlarged diameter portion to urge the seal and valve member toward the valve seat. The valve member has a flow port extending therein with at least one outlet port disposed below the groove and located axially between a valve seat and one end of a valve housing when the valve member is in the closed position to prevent fuel flow, the valve member traveling a predetermined dwell distance before the outlet port is exposed and fluid flow can exit past the valve seat when the valve member is in the open position, creating a flow area large enough to prevent a venturi that limits travel of the valve member.

None of the references cited, either alone or in combination, teaches or suggests the claimed invention of claim 20. Specifically, Gimby '254 merely discloses an over-pressure relief valve in which a valve member is reciprocable within an opening and has a first end with a part toroidal recess and an elastomeric O-ring retained in the recess. Gimby '254 lacks a fuel

pump including an outlet member having a first passageway therethrough, a valve housing disposed in the first passageway of the outlet member, a flow tube extending axially from one end of the valve housing, and a valve member having a hub with a generally hemi-spherical shape and an annular groove extending radially into the hub. Gimby '254 also lacks a fuel pump including a valve member having a flow port extending therein with at least one outlet port disposed below the groove and located axially between a valve seat and one end of a valve housing when the valve member is in the closed position to prevent fuel flow, the valve member traveling a predetermined dwell distance before the outlet port is exposed and fluid flow can exit past the valve seat when the valve member is in the open position, creating a flow area large enough to prevent a venturi that limits travel of the valve member. In Gimby '245, the valve member 12 first lifts off the valve seat and there is a small amount of flow, resulting in a metering technique and the valve member 12 does not travel a predetermined dwell distance before fluid flow can exit past the valve seat to prevent a venturi that limits travel of the valve member.

Wynn '145 merely discloses a check valve assembly having a valve seat located on an interior surface of a valve body. Wynn '145 lacks a fuel pump including an outlet member having a first passageway therethrough, a valve housing disposed in the first passageway of the outlet member, a flow tube extending axially from one end of the valve housing, a valve seat disposed adjacent the second passageway and formed on the valve housing adjacent the flow tube with a generally frustaconical cross-sectional shape and a valve member having a hub with a generally hemi-spherical shape and an annular groove extending radially into the hub. Wynn '145 also lacks a fuel pump including a valve member having a flow port extending therein with at least one outlet port disposed below the groove and located axially between a valve seat and

one end of a valve housing when the valve member is in the closed position to prevent fuel flow, the valve member traveling a predetermined dwell distance before the outlet port is exposed and fluid flow can exit past the valve seat when the valve member is in the open position, creating a flow area large enough to prevent a venturi that limits travel of the valve member. In Wynn '145, the valve member 22 first lifts off the valve seat 14 and there is a small amount of flow and the valve member 22 does not travel a predetermined dwell distance before fluid flow can exit past the valve seat 14 to prevent a venturi that limits travel of the valve member.

Smith '452 merely discloses a kinetic check valve in which a check valve has a valve member that includes a stem portion which connects a shaped poppet and a seal to form a unitary valve member. Smith '452 lacks a fuel pump including a valve member having a flow port extending therein with at least one outlet port disposed below the groove and located axially between a valve seat and one end of a valve housing when the valve member is in the closed position to prevent fuel flow, the valve member traveling a predetermined dwell distance before the outlet port is exposed and fluid flow can exit past the valve seat when the valve member is in the open position, creating a flow area large enough to prevent a venturi that limits travel of the valve member. In Smith '452, the valve member 30 first lifts off the valve seat 24 and there is a small amount of flow and the valve member 30 does not travel a predetermined dwell distance before fluid flow can exit past the valve seat 24 to prevent a venturi that limits travel of the valve member.

Hoover '391 merely discloses a check valve for engine fuel delivery systems in which a check valve is connected in a fuel line between a fuel pump and an engine. Hoover '391 lacks a fuel pump including a pump section at one axial end, a motor section adjacent the pump section, an outlet section adjacent the motor section at the other axial end, the outlet section

including an outlet member having a first passageway therethrough, and a valve housing disposed in the first passageway of the outlet member. Hoover '391 also lacks a fuel pump including a valve member having a flow port extending therein with at least one outlet port disposed below the groove and located axially between a valve seat and one end of a valve housing when the valve member is in the closed position to prevent fuel flow, the valve member traveling a predetermined dwell distance before the outlet port is exposed and fluid flow can exit past the valve seat when the valve member is in the open position, creating a flow area large enough to prevent a venturi that limits travel of the valve member. In Hoover '391, a check valve 28 is connected in the fuel line between the fuel pump 22 and the engine 26 and not in the outlet member of the fuel pump 22. As such, there is no suggestion or motivation in the art for combining Gimby '254, Wynn '145, Smith '452, and Hoover '391 together.

The references, if combinable, fail to teach or suggest the combination of a fuel pump including a pump section at one axial end, a motor section adjacent the pump section, and an outlet section adjacent the motor section at the other axial end, the outlet section including an outlet member having a first passageway therethrough, a valve housing disposed in the first passageway of the outlet member, a flow tube extending axially from one end of the body portion, a valve seat disposed adjacent the second passageway and formed on the valve housing adjacent the flow tube with a generally frustaconical cross-sectional shape, a valve member having a hub with a generally hemi-spherical shape and an annular groove extending radially into the hub, a seal disposed in the groove for contacting the valve seat, and a spring disposed about the valve member and located axially between the flange and surface of the enlarged diameter portion to urge the seal and valve member toward the valve seat, the valve member having a flow port extending therein with at least one outlet port disposed below the groove and located axially

between a valve seat and one end of a valve housing when the valve member is in the closed position to prevent fuel flow, the valve member traveling a predetermined dwell distance before the outlet port is exposed and fluid flow can exit past the valve seat when the valve member is in the open position, creating a flow area large enough to prevent a venturi that limits travel of the valve member as claimed by Applicants. The Examiner has failed to establish a case of prima facie obviousness. Therefore, it is respectfully submitted that claim 20 is allowable over the rejection under 35 U.S.C. § 103.

Obviousness under § 103 is a legal conclusion based on factual evidence (In re Fine, 837 F.2d 1071, 1073, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988), and the subjective opinion of the Examiner as to what is or is not obvious, without evidence in support thereof, does not suffice. Since the Examiner has not provided a sufficient factual basis, which is supportive of his/her position (see In re Warner, 379 F.2d 1011, 1017, 154 U.S.P.Q. 173, 178 (C.C.P.A. 1967), cert. denied, 389 U.S. 1057 (1968)), the rejections of claims 1 through 20 are improper. Therefore, it is respectfully submitted that claims 1 through 20 are allowable over the rejections under 35 U.S.C. § 103.

Based on the above, it is respectfully submitted that the claims are in a condition for allowance, which allowance is solicited.

Respectfully submitted,

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Date: October 8, 2004

Attorney Docket No.: DP-305705